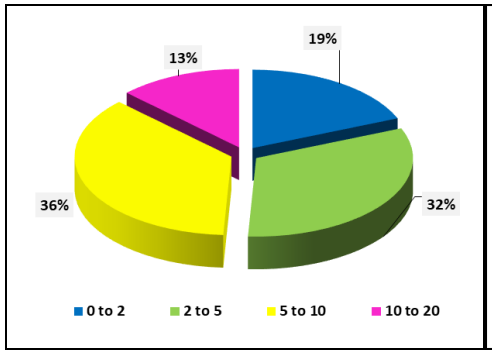

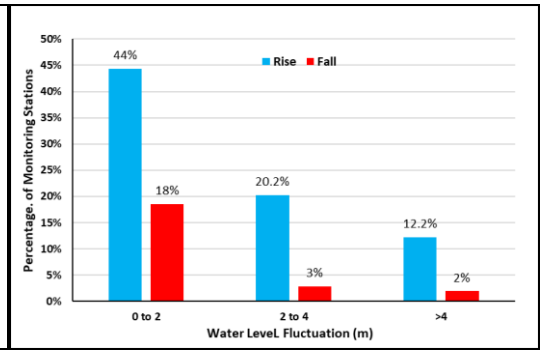

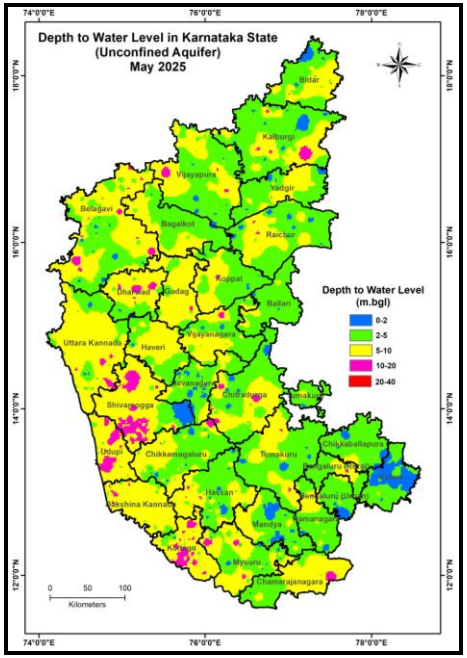

GROUND WATER LEVEL BULLETIN
MAY 2025 - KARNATAKA STATE

ABSTRACT

This report details the groundwater level scenario in Karnataka for the pre-monsoon period of May 2025. The analysis is based on data from a network of 1,322 dug wells distributed across the state's diverse hydrogeological units. For the pre-monsoon season of 2025, Karnataka received more rainfall than normal i.e., 304 mm, which is 137% more than the normal of 137 mm. Rainfall.

The depth to water level across most of the state (87%) is within 10 meters below the ground level (mbgl). Majority of wells (77%) showed a rise in water levels during May 2025 when compared to May 2024, a trend that was even more pronounced (82% rise) when compared to May 2023. Similarly, a comparison with the decadal mean (2015-2024) reveals a rise in 83% of the wells, indicating a positive trend in groundwater recharge.

The report concludes with recommendations for sustainable groundwater management, emphasizing rainwater harvesting and water conservation to ensure long-term water security.

Central Ground Water Board,
South Western Region, Bangalore

GROUND WATER LEVEL BULLETIN MAY 2025 - KARANATAKA STATE

CONTENTS

Maps & Tables list:

1. INTRODUCTION

The groundwater bulletin is a periodical publication by the Central Ground Water Board (CGWB) that depicts the changing groundwater regime of the Karnataka State across different seasons. It is an effort to obtain critical information on groundwater levels through a network of representative monitoring wells. The groundwater regime is influenced by natural climatic parameters like rainfall and evapotranspiration, as well as anthropogenic factors such as groundwater extraction for various uses, recharge from irrigation systems, and water conservation practices. The CGWB has been monitoring groundwater levels since 1970. Measurements are taken four times a year: January, May (Pre-Monsoon), August, and November (Post-Monsoon). As on March 2025, the National Hydrograph Network Stations (NHNS) in Karanataka consists of 2292 monitoring wells including 1322 dug wells and 970 piezometers.

2. STUDY AREA

The state of Karnataka has a geographical area of 1, 91, 761 sq. km. and is situated between N. Latitudes 11°31" and 18°45' and E. Longitudes 74°12' and 78°40'. For administrative purposes, the state is divided into 31 districts and 234 taluks. Physiographically, the state is categorized into four units namely Northern plain, Southern Plain, Coastal area and Hilly region. Karnataka state is drained by the rivers Krishna, Cauvery, Godavari, West flowing minor rivers, Palar, Pennar and Ponnaiyar.

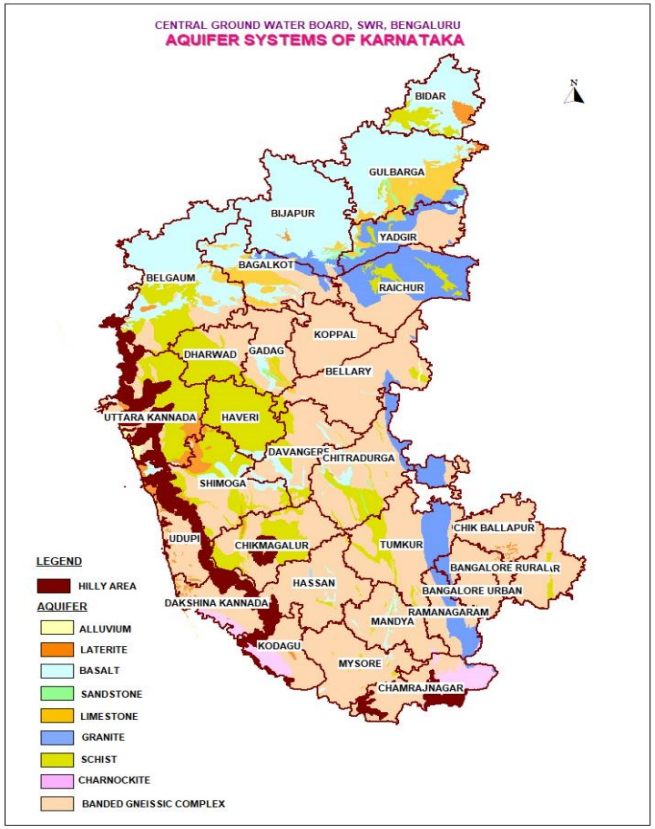

Figure 1: Map showing major aquifers and administrative divisions of the state/study area

The state of Karnataka is underlain by geological formations ranging in age from Archaean to Recent. Major portion of the State is covered by Peninsular Gneisses, Granites and Dharwarian Schists of Archaean age. Substantial area in the northern part of Karnataka is underlain by basalts, which form a continuation of the Deccan Traps occurring in Maharashtra. The sedimentaries comprising Bhima and Kaladgis occupy a small area in the northern districts. The recent alluvium is restricted to a narrow belt in the coastal area and along stream courses.

3. GROUND WATER LEVEL MONITORING

The Central Ground Water Board, South Western Region, continuously monitors the groundwater regime in Goa on a quarterly basis. The established network comprises 2292 monitoring wells including 1322 dug wells and 970 piezometers, located in diverse hydrogeological units.

For the pre-monsoon period of May 2025, groundwater levels were monitored in 1270 dug wells of 747 piezometers. The remaining stations were not monitored due to inaccessibility, pump fitted etc. The district-wise breakup of the water level monitoring stations is given in Table-1.

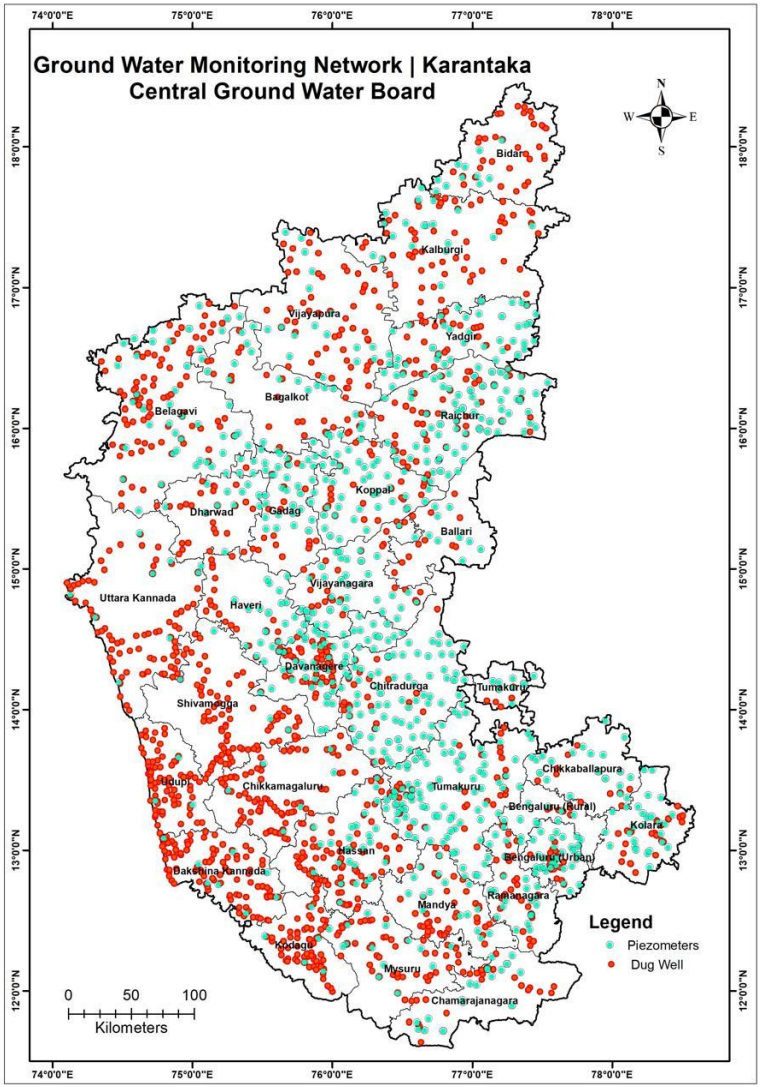

Figure. 2 Map showing locations of monitoring wells (NHNS) in the state/study area

Table 1: District-wise distribution of water level monitoring stations

S. No.	District	Total Number of Dug Well	Total Number of Piezometer
1	Bagalkot	25	23
2	Ballari	11	9
3	Bangalore Rural	10	15
4	Bangalore Urban	21	46
5	Belgaum	84	44
6	Bidar	34	11
7	Bijapur	58	19
8	Chamarajanagar	22	26
9	Chikballapur	9	24
10	Chikmagalur	76	6
11	Chitradurga	25	81
12	Dakshin Kannada	93	8
13	Davanagere	42	59
14	Dharwad	24	12
15	Gadag	20	43
16	Hassan	60	20
17	Haveri	75	27
18	Kalaburgai	24	28
19	Kodagu	73	5
20	Kolar	23	28
21	Koppal	23	49
22	Mandya	41	16
23	Mysore	56	35
24	Raichur	43	94
25	Ramnagara	26	22
26	Shimoga	78	4
27	Tumkur	40	111
28	Udupi	74	3
29	Uttar kannada	78	9
30	Vijayanagar	25	45
31	Yadgir	29	47
	Total	**1322**	**969**

4. RAINFALL AND CLIMATE

In Karnataka State, the year is generally divided into four seasons. These are: dry season (Jan-Feb), premonsoon season (Mar-May), Monsoon season (Jun-Sep) and post monsoon season (Oct-Dec). The pre monsoon season is characterised by squally weather resulting in heavy rains often accompanied by hail. The Indian summer monsoon, the harbinger of hope for the farmers, normally sets in the state by the first week of June and covers the entire state in about two weeks time. It starts withdrawing by the end of September and totally goes out of the state by the middle of October. Bulk of the annual rainfall is contributed by the summer monsoon. It is replaced by the winter monsoon, which is relatively dry. Significant rainfall occurs due to passing depressions/cyclones. The rainfall in various districts/regions/taluks has been classified as Excess (E), Normal (N) and Deficit (D) as per following criteria.

Excess : 120% of normal or more

Normal : 81% to 119% of normal

Deficit : 80% of normal or less

Based on the above classification, districts falling under the above-mentioned three of Karnataka and as well as for the State as a whole for premonsoon season during 2025 has been presented below.

The rainfall data collected and compiled from Karnataka State Natural Disaster Management Cooperation (KSNDMC), GoK for the period January 2025 - May 2025. Table 4.1 gives the district-wise rainfall data for the period January 2025 to May 2025, normal and the departure of January - May 2025 rainfall with other periods.

Pre Monsoon Season -2025 (January - May)

In general the pre-monsoon showers are received during January-May every year. For the Pre-monsoon season, the State had received an average rainfall of 304 mm, which is 137 percent more than the normal of 137 mm. Rainfall was Large excess in 25 districts, excess in 5 district and normal in 1 district (Table 4.1). Map showing the district-wise rainfall distribution in Karnataka State for the pre-monsoon 2025 period is given as Fig.4.1.

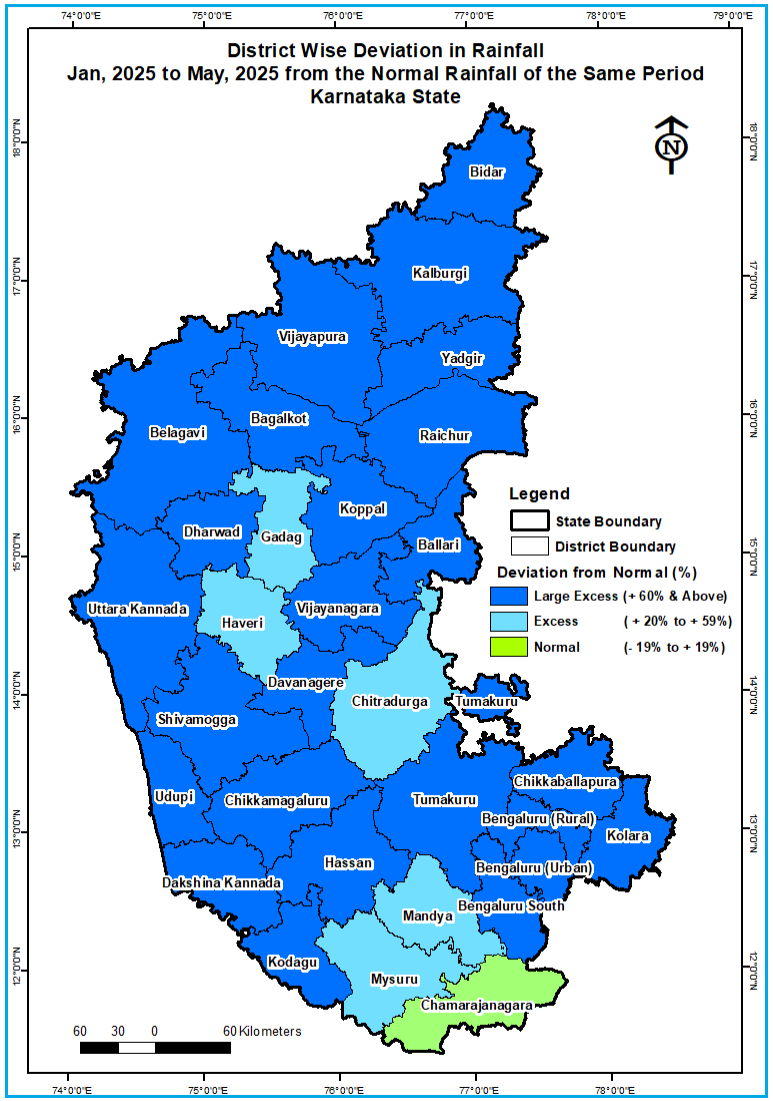

Figure. 2 Rainfall deviation from Normal

Table. 2: District-Wise Cumulative Rainfall and Percentage Departure, During Pre-Monsoon Period 2025

S. No.	District	Jan - May 2025 Actual (mm)	Jan - May 2024 Actual (mm)	Jan - May 2025 Normal (mm)	%DEP From 2024	%DEP From Normal	Category
1	Bagalkote	176.5	105	80	69	121	Large Excess
2	Ballari	121.1	80	74	52	63	Large Excess
3	Belagavi	216.9	124	95	76	129	Large Excess
4	Bengaluru Rural	248.8	147	141	70	76	Large Excess
5	Bengaluru Urban	307.1	151	156	104	97	Large Excess
6	Bidar	136.4	72	71	89	92	Large Excess
7	Chamarajanagara	224.8	197	203	14	11	Normal
8	Chikkaballapura	192.8	100	108	93	78	Large Excess
9	Chikkamagaluru	427.7	298	164	43	160	Large Excess
10	Chitradurga	155	145	103	7	50	Excess
11	Dakshina Kannada	1093.1	396	243	176	351	Large Excess
12	Davanagere	170.2	145	105	17	62	Large Excess
13	Dharwad	224.9	125	125	80	79	Large Excess
14	Gadag	165.9	103	106	61	57	Excess
15	Hassan	370.8	296	168	25	120	Large Excess
16	Haveri	191.4	139	122	38	58	Excess
17	Kalaburagi	214.9	89	67	142	221	Large Excess
18	Kodagu	750.2	311	253	141	197	Large Excess
19	Kolar	262.1	120	117	118	124	Large Excess
20	Koppala	174.4	127	82	37	113	Large Excess
21	Mandya	264.5	211	166	25	59	Excess
22	Mysuru	285.3	255	205	12	39	Excess
23	Raichur	190.3	103	69	85	178	Large Excess
24	Bengaluru South	336.7	144	178	135	90	Large Excess
25	Shivamogga	368.1	197	129	87	185	Large Excess
26	Tumakuru	224.2	189	125	19	80	Large Excess
27	Udupi	938.8	324	201	190	368	Large Excess
28	Uttara Kannada	453.4	147	103	209	340	Large Excess
29	Vijayanagar	157.8	122	99	30	60	Large Excess
30	Vijayapura	198.1	86	63	130	215	Large Excess
31	Yadgir	194.8	87	68	124	189	Large Excess
	State Total	**304**	**166**	**129**	**84**	**137**	**Large Excess**

5. GROUND WATER LEVEL SCENARIO

5.1. Unconfined Aquifer

5.1.1 Depth to Water Level Scenario in Karnataka State during May 25.

An analysis of the water level data from 1203 monitored dug wells reveals the following salient features for May 2025:

The depth to water level ranged from a minimum of ground level (mbgl) in Sarsargaon village in Gulbarga district to a maximum of 22.44 mbgl in P.Basavanahalli, village in Mysore district.

- The depth to water level over major part of the State lies within 10 m bgl i.e. 87% of wells analysed, while 13% of wells show depth to water level more than 10 m bgl range.
- Depth to water level of less than 2 m bgl has been recorded in around 19 % of wells analysed and Depth to water level in the range of 2 to 5 m bgl has been recorded in 32% of wells analysed and noted in all the districts
- Depth to water level in the range of 5 to 10 m bgl has been recorded in 36% of wells analysed and noted in almost all districts and majorly in parts of Udupi, Uttar Kannada, Dakshina Kannada disticts
- Depth to water level in the range of 10 to 20 m bgl has been recorded in 13% of wells analysed and observed in all districts Mainly in Udupi, Uttar Kannada, Shimoga, Belagum, Chitradurga, Mysore, Chamarajnagara, Gulbarga and Kodagu Districts.

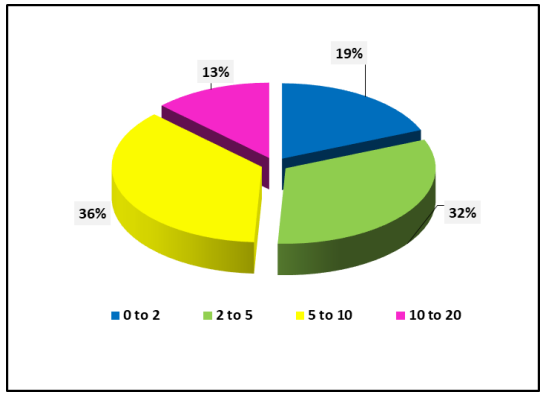

Figure 4: Percentage of wells in different water level ranges in an unconfined aquifer.

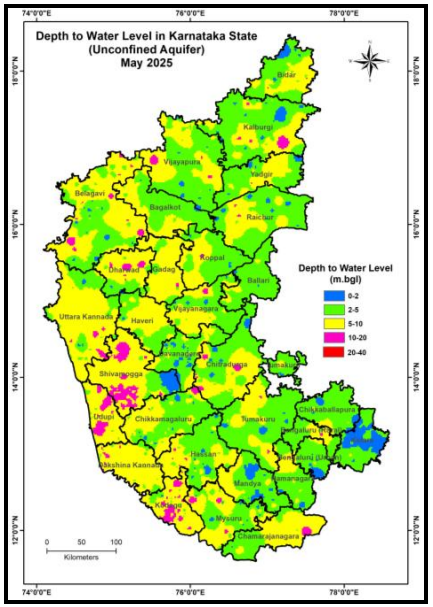

Figure 5: Depth to water level of unconfined aquifer during Pre-monsoon 2025

5.1.2 Annual Fluctuation in Water level

Annual Fluctuation of Water Level in Unconfined Aquifer (Pre-monsoon 2024 to Pre-monsoon 2025)

A comparison of water levels between Pre-monsoon 2024 and Pre-monsoon 2025 shows a rise in 77% of analyzed wells and a fall in the remaining 23%. This percentage-based distribution is presented graphically in Figure 6. The corresponding annual fluctuation in the shallow aquifer's water level is spatially plotted in Figure 7.

- Rise in the water level in the range of 0-2 m has been observed in 44% of wells and 2-4 m has been observed in 20.2% of wells in all the districts. Rise in the water level in the range of >4 m has been observed in 12.2% of wells analysed and observed in all the districts except Chamarajnagar, Mysore Kodagu, Chikballapur and Koppal districts.
- The fall in water level in the range of 0-2 m has been observed in 18% of wells analysed and noted in all the districts except, Haveri and Kolar districts. The fall in water level in the range of 2-4 m is observed in 3% of wells in the Shivamogga, Uttara Kannada, Gadag, Raichur, Bidar and Bangalore Rural, Ramnagara. Koppal, Chikballapur and Udupi districts. The fall in water level more than 4 m has been observed in 2% of wells analysed and reported in Bangalore Urban, Gadag, Raichur, Shivamogga, Udupi and Koppal districts.

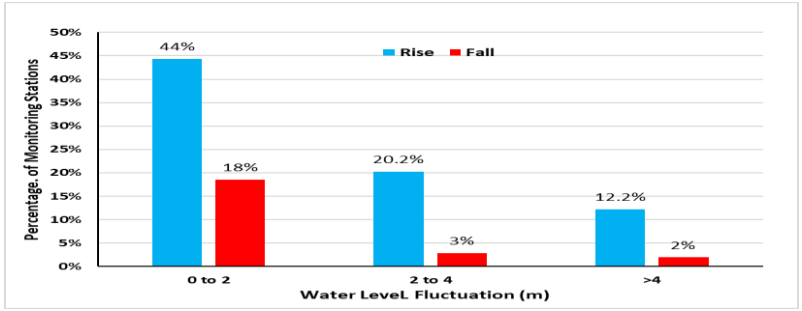

Figure 6: Percentage of wells showing rise and fall in WL in an unconfined aquifer. (Pre-monsoon 2024 to Pre-monsoon 2025)

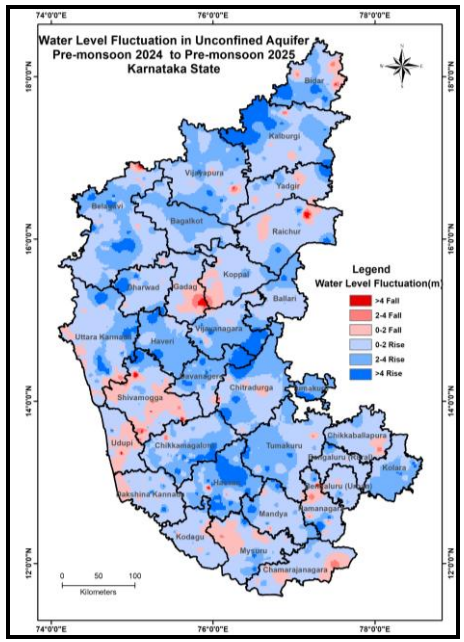

Figure 7: Annual water level fluctuation in unconfined aquifer (Pre-monsoon 2024 to Pre-monsoon 2025)

5.2.2 Annual Fluctuation of Water Level in Unconfined Aquifer (Pre-monsoon 2023 to Pre-monsoon 2025)

A comparison of water level between Pre-monsoon 2023 and Pre-monsoon 2025 shows that a rise in the water level is recorded in **82%** of wells analyzed & fall of water level recorded in **18%** of wells analysed. This percentage-based distribution is presented graphically in Figure 8. The corresponding annual fluctuation in the shallow aquifer's water level is spatially plotted in Figure 9.

Rise in the water level in the range of 0-2 m has been observed in 55% of wells analysed and observed all over the State. Rise in the water level in the range of 2-4 m has been observed in 18.8 % of wells analysed in all over the State except Raichur and Chamarajnagar district. Rise in water level more than 4m has been observed in 8.7% of wells analysed in all over the State except Raichur, Kolar, Chikballapur, Tumkur, Dharwad and Bangalore Urban districts.

The fall in water level in the range of 0-2 m has been observed in 12% of wells analysed and noted in all the districts except, Haveri, Chikamngalur, Kodagu and Kolar district. The fall in water level in the range of 2-4 m is observed in 3% of wells analyzed and noted in the, Raichur, Chitradurga, Gadag, Koppal, Shimoga and Chamrajnagara districts. The fall in water level more than 4 m has been observed in 2% of wells analysed and reported in Raichur, Chitradurga, Gadag, Koppal, Shimoga and Chamrajnagara districts.

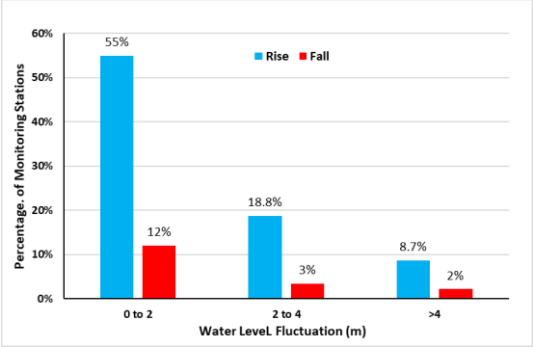

Figure 8: Percentage of wells showing rise and fall in WL in an unconfined aquifer. (Pre-monsoon 2023 to Pre-monsoon 2025)

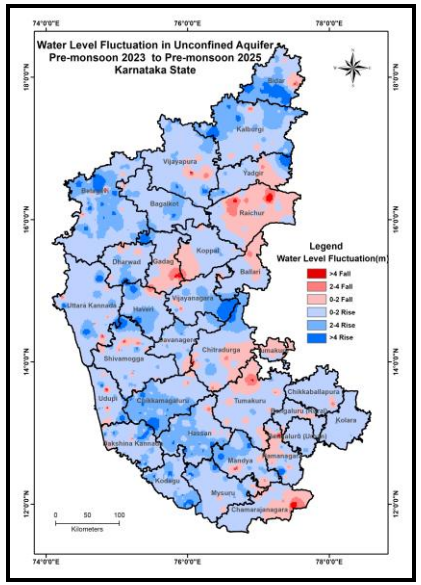

Figure 9: Annual water level fluctuation in unconfined aquifer (Pre-monsoon 2023 to Pre-monsoon 2025)

5.1.3 Decadal Fluctuation in Water Level

Decadal Fluctuation of Water Level in Unconfined Aquifer (Decadal Mean Pre-monsoon (2015-2024) to Pre-monsoon 2025)

A comparison of May 2025 water levels with the decadal average (2015-2024) shows that a rise in the water level is recorded in 83% of wells analysed & fall of water level recorded in 17% of wells analyzed. This percentage-based distribution is presented graphically in Figure 10. The corresponding annual fluctuation in the shallow aquifer's water level is spatially plotted in Figure 11.

Rise in the water level in the range of 0-2 m has been observed in 48% of wells and 2-4 m has been observed in 28.3 % of wells analysed in all over the State and water level more than 4m has been observed in 12% of wells analysed in all over the State except Kodagu, Udupi and Chamarajanagar districts.

The fall in water level in the range of 0-2 m has been observed in 14% of wells analysed and noted in all the districts except, Kolar, Bidar and Chikmangalur districts. The fall in water level in the range of 2-4 m is observed in 2% of wells analyzed and noted in the Ramnagara,Chamarajnagar, Tumkur, and Raichur districts. The fall in water level more than 4 m has been observed in 1% of wells analysed and reported in Raichur, Ramnagara and Chamrajnagara districts.

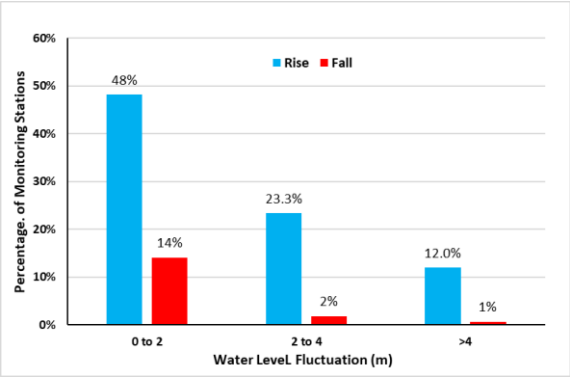

Figure 10: Percentage of wells showing rise and fall in WL in unconfined Aquifer (Decadal Mean Pre-monsoon (2015-2024) to Pre-monsoon 2025)

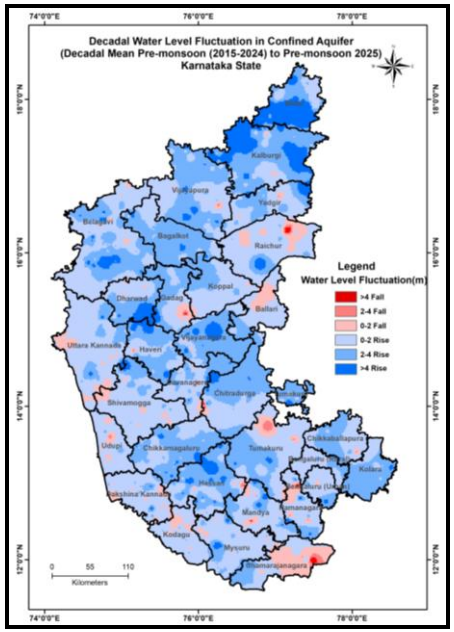

Figure 11: Decadal water level fluctuation in unconfined Aquifer (Decadal Mean Pre-monsoon (2015-2024) to Pre-monsoon 2025)

6. SUMMARY

The groundwater situation in Karnataka as of May 2025 shows positive indicators, largely influenced by a significantly above-normal pre-monsoon rainfall. The analysis of 1,203 monitored dug wells reveals that the water table in the unconfined aquifer is predominantly shallow, with 87% of wells having water levels within 10 meters of the ground surface.

Depth to Water Level in Unconfined Aquifer: The water level in the unconfined aquifer is largely within 10 meters of the surface, with 87% of wells falling in this range. Deeper water levels of more than 10 m bgl are found in 13% of the analyzed wells.

Annual Fluctuation in Unconfined Aquifer: Compared to the previous year (May 2024), a majority of wells (77%) show a rise in water levels, indicating good recharge. A similar trend is observed when comparing with May 2023, which shows a rise in 82% of the analyzed wells

Decadal Fluctuation in Unconfined Aquifer: The water level of May 2025, when compared to the decadal pre-monsoon average (2015-2024), shows that 83% of the wells have a rise in water levels. This suggests that over the last decade, groundwater recharge has generally outpaced extraction. However, about 17% of wells show a falling trend, with these declines noted in districts such as Ramanagara, Chamarajanagar, Tumkur, and Raichur, highlighting areas that may require focused management interventions.

7. RECOMMENDATIONS

To enhance the groundwater scenario of Karnataka state utmost effort should be made to harvest the rainwater received during monsoon days and use it for artificial recharge. Periodic maintenance of the structures is also recommended to maintain the efficiency of the structure. Abandoned bore wells/dug well can be used to recharge the aquifer utilizing the surplus surface runoff available during rainy days. Master plan for artificial recharge of Karnataka as well as NAQUIM reports of CGWB should be consulted for selection of artificial recharge structure sites.

Point recharge structures are recommended to recharge deeper aquifers.

Efficient micro irrigation practices can save upto 40% of water.

Use of Grey water after treatment, opting for water efficient fixtures and low flow plumbing fixtures reduce the stress on groundwater. Low flow technology is normally used in faucets, aerator, shower heads and toilets.